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The Theses on the Methodological Aspects of Financial Analysis of Corporation in the conditions of inflation

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Abstract

Purpose – research the main methods of financial analysis of corporation in the condition of inflationary processes: the analysis of financial sustainability, liquidity, profitability and etc.

Research design, Data, and methodology – the main methodical aspects of financial analysis of operations in the conditions of inflation, their efficiency are presented in the theses. Also the main financial indicators are generalized and systematized with the factor of inflation. The general scheme of adjusting the analysis of financial stability for the factor of inflation is presented.

Result – The specifics of adjusting the company's assets and liabilities for the factor of inflation during the analysis of prospective financial stability are details revealed in the article. The features of a comprehensive prospective assessment of liquidity and the financial stability are determined.

Conclusion – The account of factor of inflations in the financial operations enable reduce the losses, to identify the price of price strategy on the market, to analyze the problematic situations and develop scenarios for the development of the organization's activities in these conditions. The article the limitations and recommendations for adjusting for the factor of inflation are presented, including the necessary to clearly define the levels of their detail, since the study may be overloaded with calculations.

Keywords: Financial Analysis, Inflation, Efficiency of Financial Operations.

JEL Classification Code: G3, D24, E58

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1. Introduction: The General Provisions and Literature review.

The inflation is a phenomenon in the country's economy that has a continuous impact on the activities of any organization. In the last time a very important analysis of the financial condition of the organization with factors of inflation. Many scientists indicate that the inflation factor is considered in their research. Researches into inflationary processes were carried out by Gini (1970, 1973), Mereste (1969). Most modern scientists rely on the classical approach of inflation research the assessment of the price index, its dynamics. A similar approach can be seen in modern publications such as Dinh (2020), Kolia (2021), Diegel (2022), Foudeh (2023) and others. Sometimes scientists deepen the assessment by using the price index by industry and sub-sectors of the economy.

However, this is not enough for an in-depth analysis of inflationary processes. At the present stage of economic development, the financial analysis system requires a more detailed adaptation to the inflation factor. However, at the present stage of development, there is a need to adapt the methodology of financial analysis of corporations. There is a need to adjust the amounts of financial, investing, operating activities, including the amounts of liabilities, loans, current assets, etc. Of course, the schemes of upcoming operations in the long and short periods are being adjusted. To do this, it is necessary to assess the prospective liquidity and financial stability of the company taking into account the inflation factor (Figure 1). As part of this work, we will consider the main directions of these procedures.

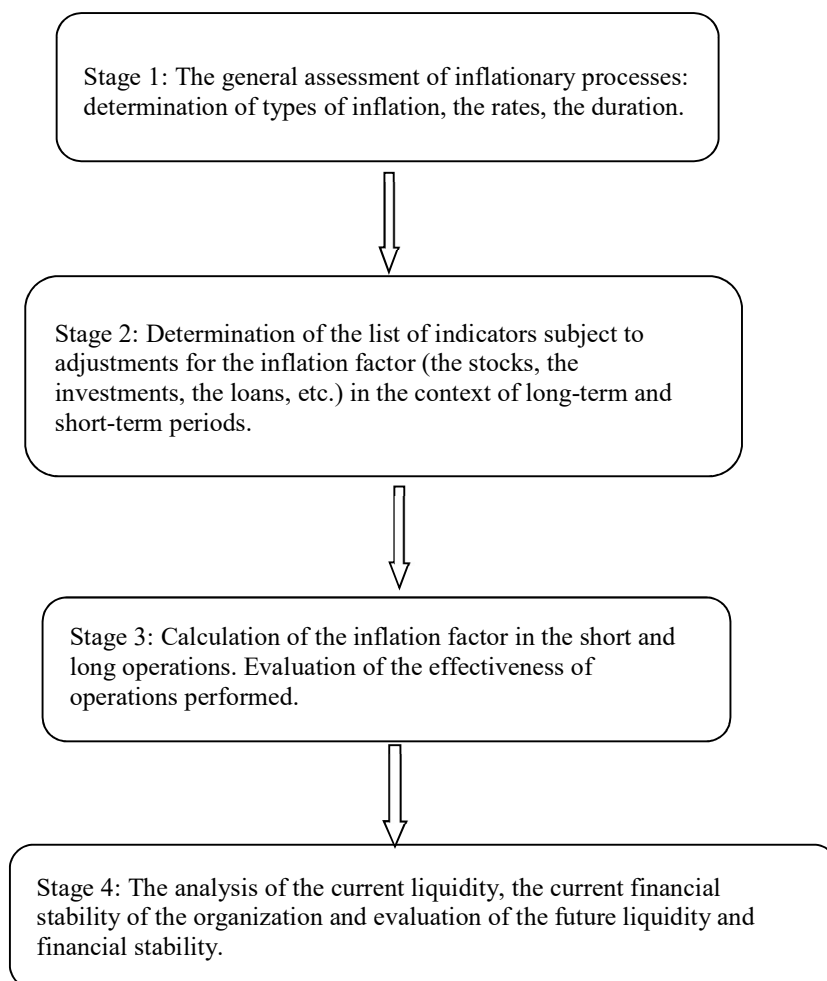


Figure 1: The General Scheme of Adjustment of Financial Analysis for the Inflation Factor.

1.1. The Traditional Techniques of Financial Calculations

In the simple case, the calculations the rate of inflation is considered differently.

$I_{pc} = 1/I_p$, where

I_{pc} – the index of purchasing capacity ability of money,

I_p – the index of price.

From here the correction sum in the operation on the factors of inflation:

$S' = S/I_p$, where

S – the sum of operation.

Consider the inflation and the financial operations.

In the 1 case - at calculation of the increased sum of money.

In the 2 case - at change of various efficiency (profitableness) financial operations.

In the short-term operations (a simple percents) The growth of the increased sum in the view of reduction purchasing capacity.

$1 + n \cdot i > I_p$

At what percents increased will compensate inflation? In the short-term operations (a simple percents):

$i^* = (I_p - 1)/n$, $i > i^*$ the rate positive or

$i^* = H$, H – the tempo of inflation.

In the long-term operations (a complex percents) we have the 2 methods: the entire amount² is indexed and the separate payments. In this case the tempo of inflation and the price index are connected:

$H = (I_p - 1) \cdot 100 \%$

$I_p = (1 + H/100)$

Therefore the average annual tempo of rise in a prices calculated:

$i_p = \sqrt[n]{I_p}$,

Π - from 1 up to t .

The tempo of inflation:

$H = 100 (\sqrt[n]{I_p} - 1)$

Inflation is a chain process (the prices in the current period raise on at percents concerning the level which has developed in the previous period)

$I_p = P \cdot \prod_{1}^t (1 + h_i)$, where

Π - from 1 up to t .

In the predicted or expected period with h - constant expectation rate of inflation.

$I_p = (1 + h/100)^n$

Forecasting of annual rate of inflation = $(1 + \text{expected average month rate of inflation})^{12} - 1$

The forecasting of annual rate of inflation (H_{if}) calculated:

$H_{if} = (1 + h_m)^{12} - 1$, where

h_m - expected average month rate of inflation.

$I_{pc}^f = 1 + H_{if}$, where

I_{pc}^f - the forecasting index of inflation.

2. The Methodological Aspects of Financial Analysis

In the inflation the analysis of financial conditions of organization has the features. We must see the details (Table 1). The liquidity and solvency indicators: in the condition of inflation the financial investment can to neglect (if the sum is insignificant) or the correction on the inflation. The shot-term liabilities increase depending on the factor of inflation. The system of coefficients includes the features: the cost of financial investments in the condition of inflation

² It is applied in Great Britain.

is lower or the unprofitable; in the calculate of current liquidity in a long term we must take the assessment inflation and etc.

If in the financial investment the financial streams are provided, then in the calculations we must consider the factors inflation (If).

Using a method of the direct account, we shall define the increased sum (S) payments (Rt) paid later time (nt) at charge of percent once a year under the complex rate at the general term n will make:

$$S = \sum_t Rt [(1 + i) * (1 + If)]^{n-nt}$$

Modern cost of a stream (A):

$$A = \sum_t \frac{Rt}{[(1+i)*(1+If)]^{nt}}$$

Other streams are adjusted by analogy.

The financial result, the indicators of future profitability are corrected by the factor of inflation (If). Consider the main parameters connected with calculation of a point of break-even:

① The income of a covering (the gross margin) (IC): Sale (S)*If - Variable expenses (VC)*If.

If the general approach prevails in the analysis, when the index of price is used in the assessment, then revenue, the sale is adjusted for the index of price of sector of economy, and the costs are adjusted for the index of price for those types that occupy the largest share in the total volume or the calculation is carried out differentially.

② The percent of the income of a covering (IC %):

$$\frac{[price-var\ iab\ cost\ (VC)] \times 100\%}{price\ (z)} \quad \text{or} \\ [IC/S] * 100\ %$$

③ A threshold of profitability (TR) =

$$\frac{const\ t\ cost(FC)*If}{income\ of\ a\ covering\ in\ percentage\ (IC\%)} \times 100\%$$

Analogously, the costs are adjusted for the index of price for those types that occupy the largest share in the total volume or the calculation is carried out differentially.

④ The critical (threshold) volume of realization (So) =

$$So = \frac{\frac{threshold\ of\ proitability\ (TR)}{price\ (z)}}{price-average\ variable\ cost*If}$$

⑤ A stock of financial durability (the margin of reliability): Sale (S)*If - A threshold of profitability (TR).

Analogously, the revenue, the sale is adjusted for the index of price of sector of economy.

⑥ The force of the operational leverage: the income of a covering (IC) / Profit*If

In this case, use the aggregate index of price.

After evaluating certain types of assets, the indicators adjusted for the factor of inflation at the stage of a comprehensive assessment, when it is necessary to determine the degree of liquidity, the long-term future financial stability of the organization, we integrate they're in the traditional methods.

Recall, in the complex assessment of financial condition can be used the integrated or the combined indicators or the system of inequalities. In particular, in the analysis of liquidity and solvency uses a system of inequalities, which is based on the grouping of balance sheets by the degree of implementation and urgency (Table 2).

Then we build inequality and make a conclusion about the liquidity of organization. With absolute liquidity, the following condition must be met as follows:

A1 П1, A2 П2, A3 П3, A4 П4

Table 1: The Main Indicators of Analysis of Financial Condition of Organization.

No	The indicator	The Standard, Recommended Values	The Liquidity and Solvency Indicators	Recommendation
1.	The coefficient of absolute liquidity (K _{al}), defined as the ratio of funds (F), the short-term financial investments (SFI) to the short-term liabilities (SL): $K_{al} = (F + SFI) / SL$	The traditionally applied on the practice – 0,07 - 0,12	The short-term liabilities (on the credit operation) to need account: $SL = SL * Ip * (1+i)^n$ or $SL = SL * [(1+n*h)/(1+h/100)]^n$ or in a long-term $SL = SL * [(1+i)^n / Ip] = P * [(1+i)/(1+h/100)]^n$, h - constant expectation rate of inflation.	It is necessary to take into account the "erosion of the capital" (Fig.1):
2.	The coefficient of intermediate liquidity is determined by the ratio (K _{il}) of funds (F), the short-term financial investments (SFI) and the receivables I to the short-term liabilities (SL): $K_{il} = (F + SFI + R) / SL$	0,5 – 0,7		
3.	The total level of coefficient of current liquidity (K _{cl}) is calculated as the ratio of current of assets (CA) to the short-term liabilities (SL): $K_{cl} = CA / SL$	On the practice are calculated individually for a particular organization.		
3.1.	It is recommended to calculate the normal level of coefficient of current liquidity (K _{cln}) [5]. The normal level of coefficient of current liquidity is determined by the ratio of current of assets in the value of short-term liabilities and the material current assets (Mos) to short-term liabilities (SL): $K_{cln} = 1 + Mos / SL$	The normal level of coefficient of current liquidity is compared with the total level of coefficient of current liquidity. If $K_{cln} > K_{cl}$ than the organization the liquidity. In the other case – not.		
3.2.	The normal level of coefficient of current liquidity The real level of current liquidity (K _{clr}). The calculation is supplemented by the fact that the fraction contains the amount of unforeseen expenses (UE): $K_{clr} = 1 + (Mos + UE) / SL$	The comparison the real level of coefficient of current liquidity with the total level of coefficient of current liquidity. If $K_{clr} > K_{cl}$ than the organization the liquidity. In the other case – not.		
4.	The coefficient liquidity in the mobilization of inventories (K _i), defined as the ratio of material production inventories (I) to the short-term liabilities (SL):	0,5 – 0,7		In the processes of assessment liquidity in the long-term, in the consider of inflation we corrected the size of inventories on the index of price for investment products in the specific branch of economy. For example, in the construction branch of economy of Russia the index ³ of price of construction products behind the 11 month of 2022 year index consist 1,0417 or 104,17 %.

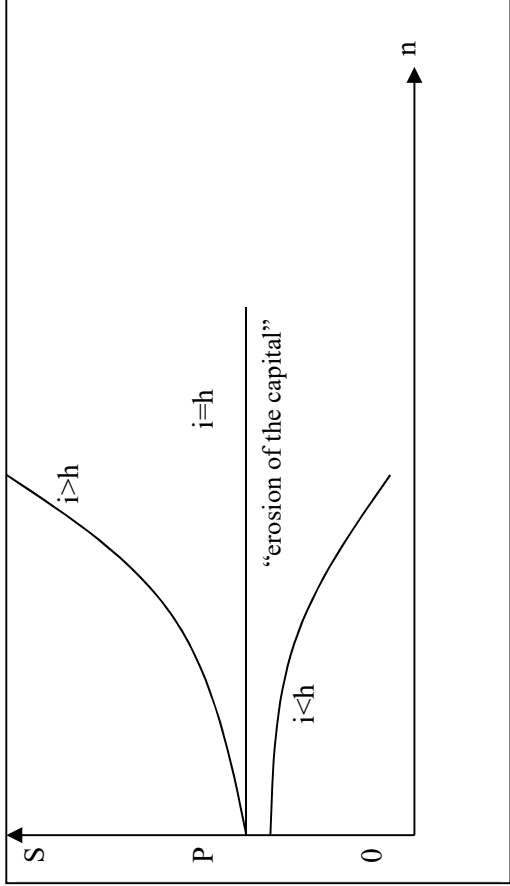


Figure 2: The analysis of operation.

³ The average geometric index was used in the calculation.

	<p>$K_i = I/SL$</p> <p>The coefficient of supply of inventories by the own current assets (Kocai), defined as the ratio of own current assets (OCA) to inventories (I): $Kocai = OCA / I$</p> <p>The own current assets are officially defined as the difference between the own current assets and the non-current assets. In the practice, as a rule, take into the account the difference between the own current assets and current assets.</p>	<p>0,6 – 0,8</p>	<p>From here, the inventories are corrected on the 1,0417. In this case, the financial result, the indicators of future of profitability are corrected also.</p>
The indicators of financial sustainability			
6.	<p>The coefficient of availability by own current assets represents the ratio (Koca) of own current assets (OCA) to current assets (CA) (current actives): $(Koca) = OCA / CA$</p>	<p>The traditionally applied on the practice $\geq 0,05$</p>	<p>The material current assets as well as inventories are adjusted on the factor of inflation. The compensation of inflation in the financial investment possible by the nominal rate L (the gross-rate).</p> <p>The method of updating of the rate of percents in the view of the inflationary premium - is formed gross-rate.</p>
7.	<p>The coefficient of maneuverability (K_m) is determined by the ratio of own current assets (OCA) to the own capital (OC): $K_m = OCA / OC$</p>	<p>0,2 – 0,5</p>	<p>The gross-rate. In the short-term operations (a simple percents): $1 + n * L = (1 + n * i) * Ip = (1 + n * i) * (1 + h/100)$ $L = [(1 + n * i) * Ip - 1] / n$</p> <p>In the long-term operations (a complex percents): $1 + L = (1 + i) * (1 + h/100)$ $L = i + h/100 + h/100 * i$</p>
8.	<p>The ratio (K_r) of borrowed assets (BA) and the own capital (OC): $K_r = BA / OC$</p>	<p>In the trade organizations, where the forming of current assets from the borrowing to the 60 %, the ratio borrowing assets and the own must be > 1.</p>	<p>If the rate is insignificant. At the small sums. Not in the favor of the owner of the big money. $L = i + h/100$</p> <p>Under the complex rate of percents - $L = i + h/100 + (h/100) * i$</p> <p>In the practice it is used $L = i + h/100$ (incorrectly, especially at a big money the sums - not in the favor of the owner of money).</p>
9.	<p>The coefficient of real value of property (K_{rp}) ratio of the amount of non-current assets (NA) and the material current assets (Mca) to the total assets (TA): $K_{rp} = (NA + Mca) / TA$</p>	<p>$> 0,5$</p>	<p>The return problem: <i>definition of the real rate, which is profitability in the view of inflation.</i></p> <p>If L - the declared norm of profitability, in this case: In the short-term operations (a simple percents): $i = 1/n * [(1 + n * L) / Ip - 1]$</p> <p>In the long-term operations (a complex percents): $i = (1 + L) / (1 + h/100) - 1$</p> <p>The simplified variant: $i^* = L - h/100$</p> <p>The positive rate i can be only at In the short-term operations (a simple percents): $(1 + n * L) / Ip > 1$ $L > h$ - the complex (compound) percents.</p>

Table 2: The Grouping of Structure of Assets by Degree of Liquidity.

Active	Passive
A 1 - the most liquid assets	П 1 - the most urgent liabilities
A 2 - the quickly realization assets (корректируются на фактор инфляции)	П 2 - the short-term loans and borrowings (корректируются на фактор инфляции)
A 3 - the slowly realization assets (corrected value of current assets) (корректируются на фактор инфляции)	П 3 - the long-term liabilities (корректируются на фактор инфляции)
A 4 - the difficult realization assets (корректируются на фактор инфляции)	П 4 - the immobilized funds (корректируются на фактор инфляции)

It should be noted that this approach, which is embedded in the system of inequalities, is not always fully maintained. As previously noted, the most liquid assets include the cash and the short-term financial investments, which are a permanent, very dynamic category. In the organization, the money can quickly forward and quickly direct in the business operations. Within the indicator of absolute liquidity ratio in the process of analysis has the recommendation character, is not decisive. Also, the first inequality - $A1 \geq П1$. If the organization did not take the long-term credit and the loans, then the third inequality is absent - $A3 \geq П3$. Thus, the system of indicators in the process of analyzing the financial condition of organization is formed by the analyst individually, taking into account the skills of researcher and the initial information. The systems of inequalities used in the analysis of financial sustainability may be different. The most widespread variants lies a definition of surplus (or lack of) of their own long-, medium-, and short-term borrowings. В этом случае они обязательно корректируются на фактор инфляции. The first time is over (lack of) $[\pm E1]$ the own capital (OC) in the formation of current assets by deducting from the own capital the values of non-current assets (NA).

$$\pm E1 = OC - NA$$

The second phase is defined over (lack of) $[\pm E2]$ the own capital and long-term funds (LA) in the in the formation of current assets as the difference between the amount of own capital with long term liabilities (before) and the non-current assets.

$$\pm E2 = OC + LA - NA$$

The third phase is defined over (lack of) $[\pm E3]$ the own capital, the long-term assets, the medium-term assets (ML), the short-term funds (SL) in the formation of current assets as the difference between the above specific tools and the non-current assets.

$$\pm E3 = OC + LA + ML + SL - NA$$

If the organization rarely uses the medium-term borrowings, it might be useful to include them in the calculation of the second stage.

The first stage, as you can see, represents the determination of our own current assets. Next is determined by the degree of sustainability. Allocate the 4 basic situation:

1. The absolute stability

$$\pm E1 \geq 0, \pm E2 \geq 0, \pm E3 \geq 0 \quad -$$

$$- \quad S = (1;1;1)$$

2. The normal resistance

$$\pm E1 \leq 0, \pm E2 \geq 0, \pm E3 \geq 0 \quad -$$

$$- \quad S = (0;1;1)$$

3. The precarious state

$$\pm E1 \leq 0, \pm E2 \leq 0, \pm E3 \geq 0 \quad -$$

$$- \quad S = (0;0;1)$$

4. The crisis state

$$\pm E1 \leq 0, \pm E2 \leq 0, \pm E3 \leq 0 \quad -$$

$$S = (0;0;0)$$

This version of inequality system does not accurately reflect the financial condition of the organization. There is another option for building inequality which uses current assets (CA) instead of non-current assets, with the third stage taking the difference between double current assets, which is due to the need for valuation not only sufficient funds to generate the minimum amount of current assets, but also to ensure normal functioning.

$$E1 = OC - CA$$

$$\pm E2 = OC + LA - CA$$

$$\pm E3 = OC + LA + ML + SL - 2CA$$

Then, similar to the first version of inequality system, the type of stability is determined. This version of inequality system is based on very stringent criteria, which can be classified as unsustainable or crisis-free by many organizations.

It is advisable to use a third version of inequality system in the process of analysis of financial sustainability. This option is also based on the definition of surplus (or lack) of own and borrowed funds in the formation of current assets as the difference between the own capital and the current assets. Only in the third stage do you need to subtract the amount of current assets not twice, but once. Twice only material current assets (Mca) are deducted, as they determine the need for funds for the normal (uninterrupted) functioning of the organization. We keep in mind the adjustment for the factor of inflation of the components.

$$E1 = OC - CA$$

$$\pm E2 = OC + LA - CA$$

$$\pm E3 = OC + LA + ML + SL - CA - Mca$$

When considering the current financial stability, the calculation of the third stage uses a variable amount of material current assets (Mca var).

$$E1 = OC - CA$$

$$\pm E2 = OC + LA - CA$$

$$\pm E3 = OC + LA + ML + SL - CA - Mca \text{ var}$$

In the process of determining prospective financial stability use the systemic part of material working capital (Mca s), and if necessary, and cumulative.

$$E1 = OC - CA$$

$$\pm E2 = OC + LA - CA$$

$$\pm E3 = OC + LA + ML + SL - CA - Mca \text{ s}$$

3. Conclusion: Remarks, Limitations and Consequences.

The account of inflationary process in the financial operations enable detailed analysis: of future and current liquidity, profitability; and the efficiency of financial operations. Also, in the condition of inflation enable detail assessment of size of amount of credit, liabilities, inventories, financial investment, the material current assets, ect. This will reduce the losses, to identify the price of price strategy on the market, to analyze the problematic situations and develop scenarios for the development of the organization's activities in these conditions, etc.

Also, in the analysis of inflationary processes, it is necessary to remember not only that the general assessment⁴ does not accurately determine the effectiveness of decisions taken, but also about accuracy in detail in the analysis of inflation. This may lead to an excessive overestimation of the inflation factor, and, accordingly, to an inadequate assessment of both individual transactions and the determination of the degree of financial stability. In this case, for self-control, it is important for the analyst at each stage of the study to conduct a factor analysis with the allocation of individual amounts that are absorbed by inflation, through the simplest factor analysis or direct counting method.

The provisions presented in the article do not include the directions and features of assessment in the context of types of inflation (the imported inflation, the inflation of credit, the inflation of costs, the inflation of induced, etc.), as well as the adaptation of accounting procedures considering the inflation factor in relation to types of financial streams, the certain types of investment transactions, which are the directions of individual researches.

The several provisions of the research should be attributed to the limitations and consequences:

⁴ For example, using the price index is most often used in practice.

1. In the long-term period, the indicator may be unreasonably overestimated since the evaluation is based on an exponential form of dependence.

2. If the analysis of inflation dynamics is based on the methods of multidimensional statistics, it is important to apply them directly to the price (to cost indicator), and then calculate the index of inflation. Otherwise (this is observed in most studies), the result turns out to be economically unsuitable (inefficient) or the evaluation of models is carried out superficially, the models are mathematically unsuitable (when working with indexes, we inevitably encounter multicollinearity).

3. When detailing the analysis of inflation, the financial stability of the company, the financial transactions, it is necessary to clearly define the levels of their detail, since the study may be overloaded with calculations. This will lead to an inadequate result.

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Appendix A

We include in the operation⁵ the factor of the taxation.

r - the rate of the taxation

$$1 + j * (1 - r) = (1 + i) * (1 + if)$$

$$j = (i + if + i * if) / (1 - r)$$

In the view of a risk factor, the formula will become:

$$j = (i + if + i * if + hr) / (1 - r)$$

hr – the "premium" for risk.

Let's consider the operation on wages.

The maturity value definition of percents in the view of taxes and inflation

1. The maturity value definition of percents in the view of taxes.

The short-term operations:

P – the initial sum,

S – the increased sum.

⁵ Let's enter designations:

i - the real interest rate,

j - the nominal interest rate,

if - the certain rate of inflation.

Completely to compensate to the creditor decreasing purchasing capacity ability of money, the following condition should be satisfied:

$$1 + j = (1 + i) * (1 + if)$$

The formula Fisher's has the following form: $i = i + if$

$$j = i + if + i * if$$

$$i = (j - if) / (1 + if)$$

$$S = P + P * n * (1-r) * i = P * [1 + n * (1-r) * i]$$

$$S'' = P * [1 + n * (1-r) * i]$$

The long-term operations:

$$S = P * [(1+i)^n * (1+if)]^n$$

1. The tax is charged for all term at once (for all sum of percents);

$$S'' = P * (1+i)^n - [P * (1+i)^n * r - P * r] = P * (1+i)^n - P * (1+i)^n * r + P * r = P * (1+i)^n * (1-r) + P * r = P * [(1-r) * (1+i)^n + r]$$

$$S'' = P * [(1-r) * (1+i)^n + r]$$

$$G = P * (1+i)^n - P = P * [(1+i)^n - 1] * r$$

2. The tax is charged consistently (for example, in the end of everyone year).

$$G = It * r = (S_t - S_{t-1}) * r = P * [(1+i)^t - (1+i)^{t-1}] * r$$

The sum of tax

$$G = P * [(1+i)^t - (1+i)^{t-1}] * r$$

Additionally:

In this case the wages in the view of inflation:

$$S' = S * [(1+h_t)^{n-1} / ((1+h_t)^n * h_t)]$$